



TECHNICAL MEMORANDUM

CH2MHILL

Summarization of Preliminary Remedial Goals Kalamazoo River/Portage Creek OU1 Site WA No. 037-RSBD-059B, Contract EP-S5-06-01

PREPARED FOR: Michael Berkoff / USEPA

PREPARED BY: CH2M HILL

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This Technical Memorandum (TM) is prepared for the U. S. Environmental Protection Agency (U.S. EPA) to develop a list of preliminary remedial goals (PRGs) for the Allied Paper Landfill (OU1) of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site for use during remedial alternative evaluation in the Feasibility Study (FS). This TM provides a qualitative assessment of the exposure pathways, receptors and land use scenarios at OU1 for consideration of PRGs for the various site media. This summary of PRGs will be compared to site-specific data and utilized during the development of an array of potential remedial alternatives in the FS to be prepared by Millennium Holdings. Further, this document will assist U.S. EPA in the evaluation of remedial alternatives presented in the FS and in the development of the ROD.

Early investigative efforts recognized that if the extent of polychlorinated biphenyls (PCBs) in OU1 was identified and appropriately remediated, then other associated hazardous substances would also be addressed (CDM, 2008). This TM is focused on PCBs as the driver for evaluating risk. Other potential contaminants of concern have been identified at OU1 and will need to be considered with PCBs for future remedial actions.

The Michigan Department of Environmental Quality (MDEQ) completed a *Site-wide Final (Revised) Human Health Risk Assessment* (CDM, 2003a) and *Final (Revised) Baseline Ecological Risk Assessment* (CDM, 2003b) for the entire Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. The Human Health Risk Assessment (HHRA) quantitatively assessed potential risks to human health through exposure to media impacted with PCBs, including the consumption of fish, direct contact with contaminated floodplain soils, and inhalation of dust and volatile emissions from floodplain soils. The Baseline Ecological Risk Assessment (BERA) quantitatively assessed potential risks to various ecological receptors for different exposure pathways. U.S. EPA has determined that risk to human and ecological receptors exists at the Site based on the results of the HHRA and BERA. A feasibility study is necessary to evaluate alternatives to mitigate the risks.

Risk-based levels from the HHRA and BERA were compiled with other established risk-based levels and regulatory criteria in the performance of this evaluation. Although the BERA is currently under peer review, the document was used in preparation of this evaluation and consideration of risk-based PRGs. In addition to the quantitative PRGs identified, a qualitative PRG is also recommended that requires either remedial actions

where residuals are visually observed or sufficient sampling to verify the residuals do not contain PCB concentrations above the applicable goals.

Conceptual Site Model

To assist with the identification of PRGs, a conceptual site model (CSM) was developed to identify sources, release mechanisms, media, exposure routes, and receptors that may be present at the site. The CSM considers exposures that may occur with residential, recreational, commercial and industrial land uses. Figure 1 presents the CSM based on human receptors. This CSM was developed based on the *Risk Assessment Guidance for Superfund* (U.S. EPA, 1998).

Figure 2 is a modified CSM to consider ecological receptors, but was limited to defining the receptors as terrestrial or aquatic-based receptors. The BERA identified the most sensitive terrestrial receptor as the robin and the most sensitive aquatic receptor as the mink. The risk-based criteria developed based on the robin and mink will be used in later evaluations.

The CSM was prepared to be inclusive of the potential scenarios that may be present in OU1. However, different media and land uses are present throughout the site. Therefore, to evaluate the risks which may be present in the different areas, OU1 was separated into four areas as shown in Figure 3. These areas are consistent with the presentation of investigation data in the RI Report (CDM, 2008) and are identified below with a description of the media present within that area:

- **Former Bryant Mill Pond** - Includes lower elevation floodplain/wetland areas adjacent to Portage Creek. The current creek channel is narrower as a result of the lowering of the Alcott Street Dam gates in 1976. Prior to the removal of these gates, the water level in Portage Creek was higher and ponding occurred over areas that are currently in the floodplain and wetland. Areas of sediment that were exposed after removal of Alcott Street Dam gates have since revegetated (CDM, 2008). The U.S. EPA conducted a removal action in the area in 1998 and 1999 to address PCBs in the sediment. The initial excavation was performed with an action level of 10 mg/kg and a goal of achieving post-excavation PCB concentrations less than or equal to 1 mg/kg.
- **Residential/Commercial Areas** - Is comprised of privately owned residential and commercial lands located outside of the eastern and western boundaries of OU1 where PCB concentrations and residuals were identified during the RI. Step-out sampling was performed to define the extent of impacts away from areas where residuals were observed. As a result, areas of higher concentration may be present and additional characterization may be required for comparison to the selected PRGs.

This area includes, but is not limited to, the Panelyte Property (excluding the Panelyte Marsh), Stryker Corporation, Conrail, Clay Seam Area, East Bank Area, other properties and the Portage Creek adjacent to this area (CDM, 2008). This area includes surface and subsurface soil and sediment with varied land use. These properties listed above are not a part of OU1 as it has been defined. Any remediation in this area, proposed as a part of the OU1 FS, would be to clean up contamination that spread from OU1.

- **Former Operations Area** - The Former Operations Area includes Bryant historical residuals dewatering lagoon (HRDL) and former residuals dewatering lagoons (FRDLs), Monarch HRDL, Type III Landfill, Western Disposal Area, and the Alcott Street Properties. The landfill cap over the Bryant HRDL and FRDLs is at a higher elevation with lower elevation soils and wetlands present in the area (CDM, 2008). Interim response measures have been completed in the Former Operations Area since the early to mid 1990s and include the following actions:
 - Installation of 2,600 linear feet of sheet pile along the west bank of Portage Creek.
 - Removal and backfill of several hundred cubic yards (cy) of soil containing residuals from locations between the sheet pile wall and Portage Creek, and consolidation into the Bryant HRDL and FRDLs.
 - Removal and backfill of approximately 1,700 cy of residuals located within the floodplain on the east side of Portage Creek (East Bank area) in 2002, and consolidation into the Bryant FRDLs.
 - Construction of a landfill cap over the Bryant HRDL and FRDLs after consolidation of the soils and residuals as described above.
 - Design and installation of a groundwater recovery system to mitigate mounding of shallow groundwater behind the sheet pile along Portage Creek.

The interim actions will be discussed and incorporated into the alternatives evaluated in the FS. As stated in the final Bryant Mill Pond Administrative Agreement, "The Bryant Mill Pond Area Removal Action is intended to be consistent with what U.S. EPA anticipates will be the final remedy to be selected by MDEQ" (U.S. EPA, 1998).

- **Panelyte Marsh** - The Panelyte Marsh is located at the southeastern end of the Panelyte property, north of the Western Disposal Area. Surface water from the Panelyte fill area and Western disposal area drains towards the Panelyte Marsh, which then drains to Portage Creek (CDM, 2008).

The boundaries presented in Figure 3 are consistent with the RI Report. These boundaries may need to be redefined during the feasibility study or remedial design. The remedial design will need to consider media definition and the current and planned future land-use for each area.

Identification and Development of PRGs

PCBs are the primary contaminant of concern and the risk driver at OU1 (CDM, 2008). Therefore, for the potentially complete pathways identified in the CSMs, a range of PRGs for PCBs were identified for the various media present. The PRGs were identified utilizing information from the HHRA, BERA, and chemical-specific applicable or relevant and appropriate requirements (ARARs).

Attachment 1 includes all the criteria that were considered and a discussion on the applicability and retention of the criteria as a potential PRG. Site-specific risk-based numbers presented in the HHRA and BERA and Part 201 Generic Cleanup Criteria were

retained as PRGs for soil, sediment, and groundwater and are presented in Table 1. Screening levels presented in guidance documents (i.e. DOE Oak Ridge National Laboratory Screening levels) were identified, as shown in Attachment 1, but were not retained for further evaluation as PRGs.

PRGs are not included in this evaluation for surface water and fish tissue. By addressing soil, sediment, and groundwater sources, it is anticipated that the surface water and fish will be addressed over time. The fish consumption advisories will be maintained independent of this evaluation.

The relevance of PRGs for a specific area will depend upon the media present along with the receptors and current and future land use. The PRGs included in Table 1 for consideration are discussed below:

- Sediment criteria of 0.33 mg/kg, protective of human health based on consumption of fish. The risk-based criteria developed in the HHRA for protection of human health based on fish consumption are below the MDEQ ERD/SWQD detection limit of 0.33 mg/kg for sediment, so 0.33 mg/kg is the default sediment criteria (CDM, 2003a). The sediment criteria are also applied to areas that are inundated. The period of inundation that is applicable is currently being developed. The criteria was developed assuming the pathway from sediment to fish to consumer is complete.
- Under Michigan Rule 201 R299.5728 (f), the response action must provide for the effective control of contaminated soils from erosion.
- Sediment criteria of 0.5 mg/kg to 0.6 mg/kg protective of aquatic ecological receptors based on the NOAEL and LOAEL for mink (CDM, 2003b).
- Soil criteria of 2.5 mg/kg, protective of human health in a residential land-use scenario with exposure to contaminated soil via ingestion, dermal contact, and inhalation (CDM, 2003a).
- Soil criteria of 6.5 mg/kg to 8.1 mg/kg protective of terrestrial ecological receptors based on the NOAEL and LOAEL for the robin (CDM, 2003b).
- Soil criteria of 16 mg/kg, protective of human health in a commercial/ industrial land-use scenario based on Part 201 criteria (MDEQ, 2004).
- Soil criteria of 23 mg/kg protective of human health for a recreationalist in a non-residential land-use scenario with exposure to contaminated soil via ingestion, dermal contact, and inhalation (CDM, 2003a).
- Groundwater criteria of 0.2 µg/L protective of surface water where a groundwater/surface water interface (GSI) is present based on Part 201 criteria (MDEQ, 2004).
- Groundwater criteria of 3.3 µg/L protective of human health through direct contact with groundwater based on Part 201 criteria (MDEQ, 2004).
- Removal of residuals observed in soil and sediment based on visual identification unless sufficient analytical data is available to demonstrate PCBs are not present above the applicable goals in a target area.

Sensitivities

This TM was prepared based on available information from the RI Report and assumptions in development of the CSM. The key assumptions and other limitations are summarized below:

- Area boundaries shown in Figure 3 are based on the RI study areas. Boundaries may require further evaluation and breakdown during the FS for application of the PRGs.
- The HHRA sediment cleanup criteria protective of human health from fish consumption has a range of 0.04 mg/kg to 0.30 mg/kg for PCBs. Because the MDEQ detection limit of 0.33 mg/kg for PCBs is greater than the risk-based level, the PRG protective of people consuming fish defaults to 0.33 mg/kg.
- Sediment criteria of 0.33 mg/kg is based on sediment to fish to human being complete pathway.
- PCB concentrations have been detected in the shallow groundwater aquifer. The drinking water pathway is considered incomplete at the site since no drinking water wells are present.
- The drinking water pathway may be incomplete for off site areas given the following reasons:
 - Several confining layers between the shallow and deep aquifers have been observed in city supply wells (CDM, 2008), that are located approximately 1 mile from the site.
 - An upward gradient from the deep to the shallow aquifer has been observed in the same nearby city supply wells (CDM, 2008).
 - No PCB contamination has been detected in the municipal well field sampling. The well field has been monitored for the last 20 years; however, with the exception of 2007, reporting limits were greater than the maximum contaminate level (MCL). Data from 2007 had reporting limits less than the MCL and PCBs were not detected in the samples.
 - PCBs are considered relatively insoluble and are thought to not migrate significantly in groundwater (CDM, 2008).
 - Onsite shallow groundwater flow is believed to follow the regional topography to the east where it discharges to Portage Creek (CDM, 2008).
 - Regionally, shallow groundwater flow is to the north, side gradient to the municipal well field located to the northwest of the site.

Controls should be established within OU1 to prevent the installation of drinking water wells onsite and completion of the drinking water pathway. Zoning currently prevents installation of wells if public water supply is available. Should new information provide evidence of a completed drinking water pathway, the PRGs for groundwater will be re-evaluated.

- PRGs are not included in this evaluation for surface water and fish tissue. By addressing soil, sediment, and groundwater, it is anticipated that the surface water and fish will be addressed over time.

The default sediment criteria of 0.33 mg/kg for PCBs is roughly equivalent to the risk-based concentration of 0.30 mg/kg for the Sport Angler - Central Tendency based on fish consumption for 24 meals per year. OU1 is only one of five operable units in the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. This criteria was identified to be protective of human health whether an angler is catching fish only within this operable unit or within the site as a whole.

Future Use

It is U.S. EPA's intent that this summary of PRGs will be used by the Responsible Parties in the development of the FS. The information in this document will be compared to site-specific data and used in the development of an array of alternatives in the FS. U.S. EPA will use the information summarized in this TM in consideration of remedies for this OU.

References

- CDM, 2003a. *Final (Revised) Human Health Risk Assessment (HHRA) of the Allied Paper, Inc./Portage Creek/Kalamazoo River (API/PC/KR) Superfund Site*. April 2003.
- CDM, 2003b. *Final (Revised) Baseline Ecological Risk Assessment (BERA) for the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site*. April 2003.
- CDM, 2008. *Allied Paper Inc. Operable Unit Remedial Investigation Report, for the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site*. April 2008.
- MDEQ, 2004. *RRD Operational Memorandum No. 1, Part 201 Cleanup Criteria, Part 213 Risk-based Screening Levels*. December 10, 2004.
- MDEQ, 2008 *Interdepartmental Communication Brant Fisher, Environmental Engineer Specialist to Paul Bucholtz/Project Manager, Remedial Investigation Report - Allied Disposal Site*. April 30, 2008.
- U.S. EPA, 1989. *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A)*. Office of Emergency and Remedial Response. U.S. EPA/540/1-89/002
- U.S. EPA. 1998. CERCLA Docket No. V-W-98-C-473. Final Administrative Agreement executed by the US Department of Justice on June 2, 1998.

Figures

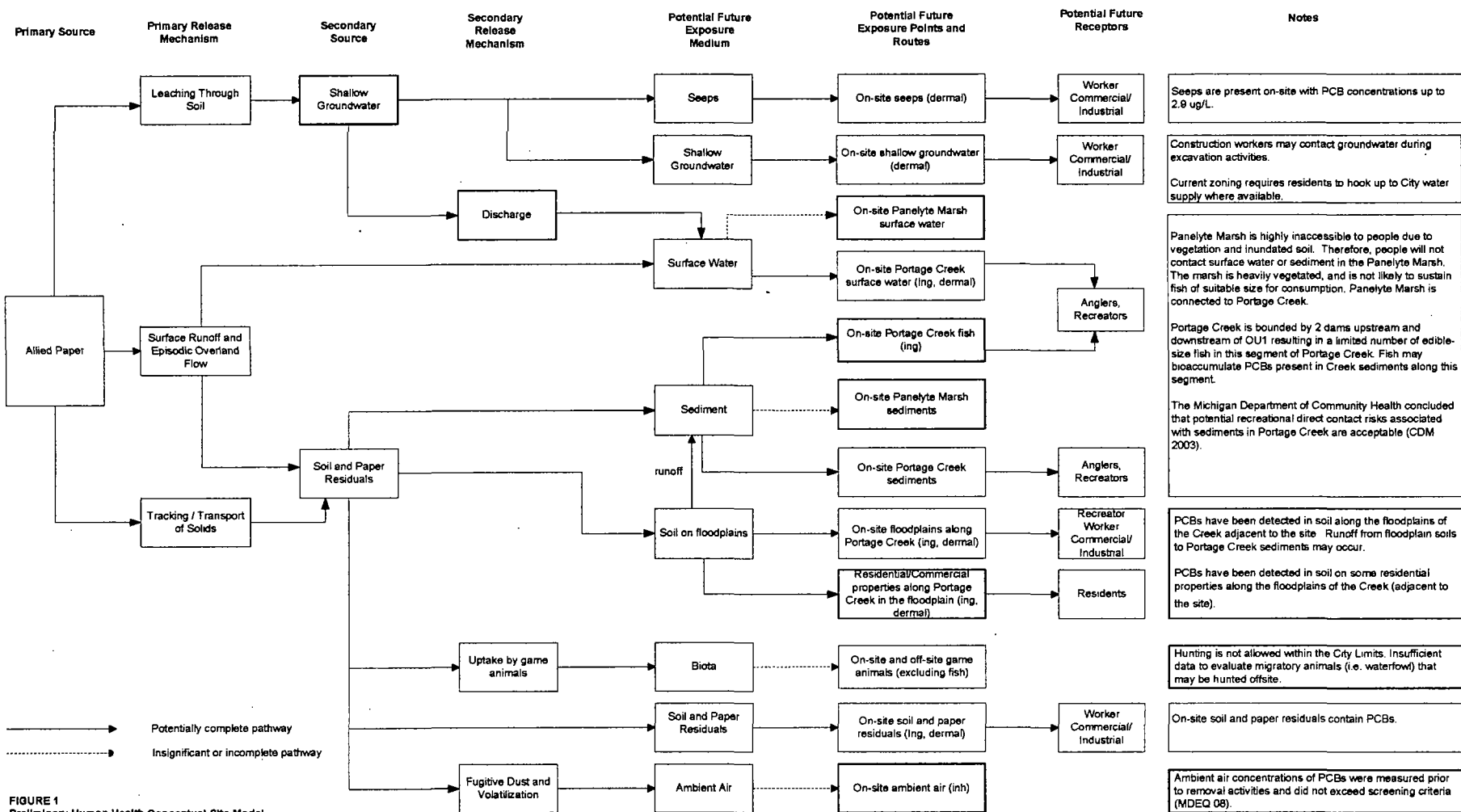


FIGURE 1
Preliminary Human Health Conceptual Site Model
Allied Paper OU-1

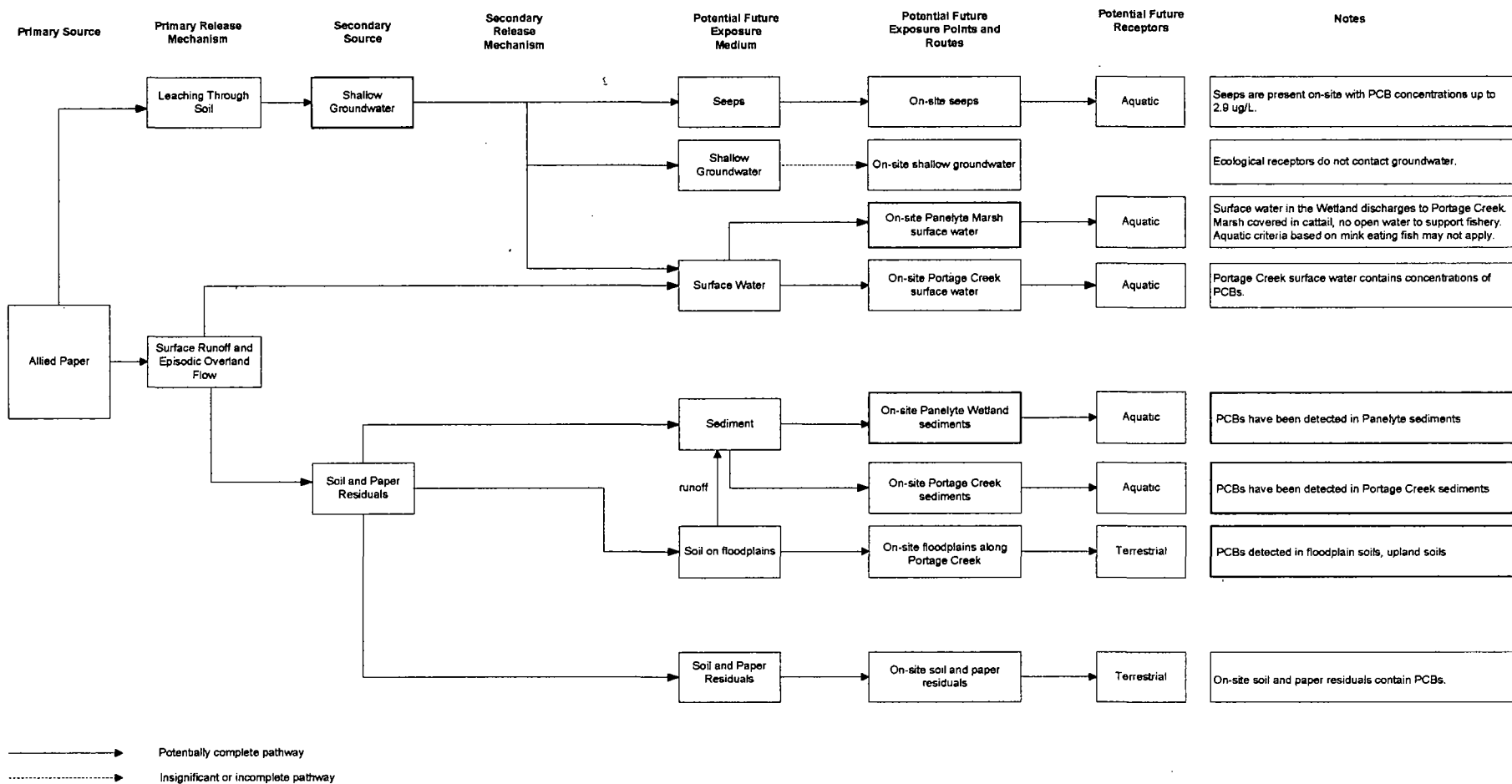


FIGURE 2
 Preliminary Ecological Conceptual Site Model
 Allied Paper OU-1

Tables

Table 1**Preliminary Remedial Goals***Draft Preliminary Remedial Goal Identification*

| Media | Pathway | Source | Preliminary Remedial Goals |
|----------------------------------|----------------------------|-------------------------------|--|
| Surface Soils | Human Health | Fish Consumption ¹ | HHRA 0.33 mg/kg ¹ |
| | | Residential | HHRA 2.5 mg/kg |
| | | Commercial II /Industrial | 201 Generic Cleanup Criteria 16 mg/kg |
| | | Recreationalist | HHRA 23 mg/kg |
| | Ecological | Aquatic | BERA 0.5 mg/kg / 0.6 mg/kg |
| | | Terrestrial | BERA 6.5 mg/kg / 8.1 mg/kg |
| Subsurface Soils | Human Health | Residential | HHRA 2.5 mg/kg |
| | | Commercial II /Industrial | 201 Generic Cleanup Criteria 16 mg/kg |
| | | Commercial/Industrial | HHRA 23 mg/kg |
| | Ecological | Terrestrial | BERA 6.5 mg/kg / 8.1 mg/kg |
| Surface Sediments | Human Health | Fish Consumption | HHRA 0.33 mg/kg |
| | Ecological | Aquatic | BERA 0.5 mg/kg / 0.6 mg/kg |
| Subsurface Sediment | Human Health | Fish Consumption | HHRA 0.33 mg/kg |
| | Ecological | Aquatic | BERA 0.5 mg/kg / 0.6 mg/kg |
| Groundwater (including seeps) | Human Health ² | 201 Generic Cleanup Criteria | 3.3 g/L |
| | Surface Water ³ | 201 Generic Cleanup Criteria | 0.2 g/L |

¹ Default sediment criteria of 0.33 mg/kg will be applied to shallow soil in areas of periodic inundation due to the potential runoff of shallow soils into surface water. Evaluation of contaminated soil runoff to surface water required under R299.5728(f)

² Groundwater for use as drinking water is not considered a complete pathway so the Part 201 Drinking Water criteria of 0.5 g/L was not used. The Part 201 direct contact criteria was used for protection of human health due to the presence of seeps.

³ The groundwater criteria protective of surface water is a PRG where the GSI is present.

Attachment 1
Summary of Suggested Remedial Goals and
Applicable or Relevant and Appropriate
Requirements

ATTACHMENT 1

Evaluation of Applicable or Relevant and Appropriate Requirements

Draft Preliminary Remedial Goal Identification

| Citation | Summary of Requirement | Criteria |
|---|--|--|
| Soil | | |
| Final (Revised) Human Health Risk Assessment (HHRA) of the Allied Paper, Inc./Portage Creek/Kalamazoo River (API/PC/KR) Superfund Site. CDM, April 2003 | <p>The HHRA calculated risk-based concentrations (RBCs) for PCBs in soil protective of residents and recreationalists. RBCs were developed for both cancer and noncancer endpoints. Risk-based concentrations were developed for PCBs using an allowable cancer risk of 1 in 100,000 and a noncancer hazard index of 1.0.</p> <p>The RBC for soil would be protective of residents exposed to contaminated soil via ingestion, dermal contact, and inhalation. For the cancer endpoint the RBC for soil is 2.5 mg/kg. For noncancer endpoints, the RBC is 15 mg/kg for the reproductive endpoint and 4 mg/kg for the immunological endpoint.</p> <p>RBCs protective of recreationalists exposed to contaminated soil via ingestion, dermal contact, and inhalation include a RBC 23 mg/kg for cancer endpoints. For noncancer endpoints, the RBC is 139 mg/kg for the reproductive endpoint and 32 mg/kg for the immunological endpoint.</p> <p>The HHRA criteria are site-specific values calculated for the Kalamazoo River Superfund Site. The 1E-05 values calculated for cancer endpoints are the most protective values and were retained as PRGs for residential (2.5 mg/kg) land use and for protection of a recreationalist with non-residential land use (23 mg/kg).</p> | <p><u>Residential</u></p> <p>1E-5 Risk 2.5 mg/kg HI = 1.0 (immunological) 4 mg/kg HI = 1.0 (reproductive) 15 mg/kg</p> <p><u>Non-residential</u></p> <p>1E-5 Risk 23 mg/kg HI = 1.0 (immunological) 32 mg/kg HI = 1.0 (reproductive) 139 mg/kg</p> |
| Michigan Natural Resources and Environmental Protection Act—Part 201 of Act 451 (Part 7 R299.5701- 5707, 5718-5752) | <p>Provides generic cleanup criteria and screening levels for direct contact with soil. Part 7 adopts the criteria established by TSCA; however, it also provides direct contact criteria for soil if TSCA standards are not applicable.</p> <p>If TSCA standards are not applicable, Generic Residential Land Use Criteria of 4 mg/kg PCB (soil) is established to be protective of human health for residential land-use under Part 201, Environmental Remediation of Natural Resources and Environmental Protection Act, PA 451 of 1994, as amended, and Part 201 Administrative Rules.</p> <p>If TSCA standards are not applicable, Generic Commercial II and Industrial Land Criteria of 16 mg/kg PCBs (soil) is established to be protective of human health for onsite workers and/or trespassers under Part 201, Environmental Remediation of the Natural Resources and Environmental Protection Act, PA 451 of 1994, as amended, and Part 201 Administrative Rules.</p> <p>The Part 201 Residential cleanup criteria of 4 mg/kg is less protective than the residential criteria developed in the HHRA and was therefore not retained as a PRG.</p> | <p>Residential 4 mg/kg Industrial 16 mg/kg</p> |

ATTACHMENT 1

**Evaluation of Applicable or Relevant and Appropriate Requirements
Draft Preliminary Remedial Goal Identification**

| Citation | Summary of Requirement | Criteria |
|--|---|--|
| | The Part 201 Commercial / Industrial cleanup criteria of 16 mg/kg, was considered as a PRG for industrial / commercial land use. | |
| Final (Revised) Baseline Ecological Risk Assessment (BERA) for the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. CDM, April 2003. | <p>The No Observed Adverse Effect Level (NOAEL) to Lowest Observed Adverse Effect Level (LOAEL) range from 6.5 mg/kg to 8.1 mg/kg PCB in soil for the protection of terrestrial ecological receptors (the American Robin) as established in the Baseline Ecological Risk Assessment (BERA). The BERA is currently under peer review, but was used for evaluation of PRGs.</p> <p>The NOAEL and LOAEL are site-specific values calculated for the Kalamazoo River Superfund Site and are retained as PRGs for evaluation of terrestrial ecological receptors.</p> | <p>NOAEL 6.5 mg/kg LOAEL 8.1 mg/kg</p> |
| <p>DOE Oak Ridge National Laboratory (ORNL) Screening Levels for Chemical Contaminants including the Region 9 PRG</p> <p>(http://epa-prgs.ornl.gov/chemicals/index.shtml)</p> | <p>Generic screening levels (SLs) are based on default exposure parameters and factors that represent Reasonable Maximum Exposure (RME) conditions for long-term/chronic exposures and are based on the methods outlined in EPA's Risk Assessment Guidance for Superfund, Part B Manual (1991) and Soil Screening Guidance documents. The screening levels provided correspond to a 10⁻⁶ cancer risk for high risk PCBs, such as Aroclors 1242, 1248, 1254, and 1260. Region 9 Preliminary Remediation Goals (PRGs) protective of human health for the ingestion, inhalation and dermal contact exposure pathways for soil are 0.22 mg/kg for residential use (high risk PCBs) and 0.74 mg/kg for industrial land-use (high risk PCBs).</p> <p>Region 9 PRGs are intended for use as screening levels to determine if remedial actions may be necessary, but are not intended to be used as cleanup criteria. The Region 9 PRGs are not regulatory criteria or site-specific values and were not carried forward for further evaluation as PRGs.</p> | <p>Residential 0.22 mg/kg Industrial 0.74 mg/kg</p> |
| <p>USEPA, Office of Emergency and Remedial Response, EPA 540/G-90/007</p> <p>(OSWER Directive 9355.4-01)</p> | <p>Describes the recommended approach for evaluating and remediating Superfund Sites with PCBs. Provides preliminary remediation goals for certain media and other considerations. Recommends that the goals for soils generally should be 1 ppm for residential areas, or higher (10–25 ppm) for sites where non-residential use is anticipated.</p> <p>The guidance document provides preliminary remedial goals based on land uses. These are not regulatory criteria or site-specific values, so the criteria were not retained as PRGs.</p> | <p>Residential 1 mg/kg Non-residential 10 - 25 mg/kg</p> |

ATTACHMENT 1

**Evaluation of Applicable or Relevant and Appropriate Requirements
Draft Preliminary Remedial Goal Identification**

| Citation | Summary of Requirement | Criteria | |
|---|---|--|-------------------------------|
| Toxic Substance Control Act— Subpart D (40 CFR 761.50-761.79) | PCBs are regulated by Toxic Substance Control Act (TSCA) under 40 CFR 761. Subpart D of Part 761, Storage and Disposal, establishes procedures for self-implementing clean up of general, moderately-sized sites, including clean up criteria. In place of the self-implementing criteria, TSCA allows for site-specific risk-based criteria to be determined and used under 40 CFR 761.61 (c) <i>Risk-based disposal approval</i> . Site-specific values are provided in the HHRA so the TSCA Subpart D criteria were not retained as PRGs. | <u>Residential & Commercial I</u> | 1 mg/kg 10 mg/kg if capped |
| | | <u>Industrial & Commercial II, III or IV</u> | 1 mg/kg 10 mg/kg if capped |
| Toxic Substance Control Act— Subpart G (53 U.S.C. 2301 et seq.; 40 CFR 761.120-761.135) | PCBs are regulated by the Toxic Substance Control Act (TSCA) under 40 CFR 761. Subpart G of Part 761, Spill Cleanup Policy, establishes the criteria by which spill cleanup should be judged. Subpart G applies only to spills that occurred after May 4, 1987. With few exceptions that are left to the discretion of USEPA (40 CFR 761.123 [d][2]), Subpart G promulgates soil cleanup levels for PCB spills of low and high concentrations. For low concentration spills involving less than 1 pound of PCBs by weight, TSCA Subpart G requires all soil within the spill area (i.e., the visible traces of a spill and the 1-foot lateral buffer zone surrounding the visible traces) to be excavated and the ground to be restored with backfill containing less than 1 ppm PCBs. For high concentration spills (or low concentration spills involving more than 1 pound of PCBs by weight), TSCA Subpart G promulgates soil cleanup levels of 10 mg/kg for nonrestricted access areas and 25 mg/kg for restricted access areas. Spills which occurred prior to May 4, 1987, are excluded from the scope of this policy and require site-by-site evaluation. Site-specific values are provided in the HHRA, so the TSCA Subpart G criteria were not retained as PRGs. | Nonrestricted access | 10 mg/kg |
| | | Restricted access | 25 mg/kg |
| <u>Sediment</u> | | | |
| Final (Revised) Human Health Risk Assessment (HHRA) of the Allied Paper, Inc./Portage Creek/Kalamazoo River (API/PC/KR) Superfund Site. CDM, April 2003 | The HHRA sediment cleanup criteria protective of people consuming fish range from 0.04 mg/kg to 0.30 mg/kg PCB; however, because MDEQ has a detection limit of 0.33 mg/kg for PCBs, the cleanup criteria protective for people consuming fish defaults to 0.33 mg/kg. The risk based concentrations (RBCs) from the HHRA are presented below: | Default | 0.33 mg/kg |
| | <u>RBC for 1E-05 based on Bass/Carp Ingestion</u> Subsistence angler (179 meals/yr) Sport angler – high end (125 meals/yr) Sport angler – central tendency (24 meals/yr) | | |

ATTACHMENT 1

Evaluation of Applicable or Relevant and Appropriate Requirements
Draft Preliminary Remedial Goal Identification

| Citation | Summary of Requirement | Criteria |
|--|---|--|
| | <p><u>RBC for HQ = 1 based on Bass/Carp Ingestion</u></p> <p>Subsistence angler (179 meals/yr) 0.07 mg/kg</p> <p>Sport angler – high end (125 meals/yr) 0.20 mg/kg</p> <p>Sport angler – central tendency (24 meals/yr) 0.52 mg/kg</p> <p>The default criteria of 0.33 mg/kg was evaluated as a PRG since the HHRA criteria calculated for the angler are below the analytical detection limit. The default criteria of 0.33 mg/kg was retained as a PRG for sediment.</p> | |
| Final (Revised) Baseline Ecological Risk Assessment (BERA) for the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. CDM, April 2003. | <p>The No Observed Adverse Effect Level (NOAEL) to Lowest Observed Adverse Effect Level (LOAEL) range of 0.5 mg/kg to 0.6 mg/kg PCB in sediment for the protection of aquatic ecological receptors (mink) as established in the BERA. The BERA is currently under review, but was used for evaluation of PRGs.</p> <p>The NOAEL and LOAEL for aquatic receptors are site-specific values calculated for the Kalamazoo River Superfund Site. The NOAEL and LOAEL were retained for consideration as PRGs.</p> | <p>NOAEL 0.5 mg/kg</p> <p>LOAEL 0.6 mg/kg</p> |
| <p>Toxic Substance Control Act—Subpart D</p> <p>(40 CFR 761.50-761.79)</p> | <p>PCBs are regulated by Toxic Substance Control Act (TSCA) under 40 CFR 761. Subpart D of Part 761, Storage and Disposal, establishes procedures for self-implementing clean up criteria for general, moderately sized sites. The self-implementing criteria are not to be used for sediments.</p> <p>In place of the self-implementing criteria, TSCA allows site-specific risk-based criteria to be determined and used under 40 CFR 761.61 (c) <i>Risk-based disposal approval</i>. Site specific values are provided in the HHRA so the TSCA Subpart D criteria were not retained as PRGs.</p> | <p><u>Residential & Commercial I</u></p> <p>1 mg/kg</p> <p>10 mg/kg if capped</p> <p><u>Industrial & Commercial II, III or IV</u></p> <p>1 mg/kg</p> <p>10 mg/kg if capped</p> |
| <p>USEPA, Office of Emergency and Remedial Response, EPA 540/G-90/007</p> <p>(OSWER Directive 9355.4-01)</p> | <p><i>Guidance on Remedial Actions for Superfund Sites with PCB Contamination</i> prepared by the USEPA, Office of Emergency and Remedial Response, EPA 540/G-90/007 (OSWER Directive 9355.4-01), describes the recommended approach for evaluating and remediating Superfund Sites with PCBs and provides preliminary remediation goals for certain media and other considerations. Interim sediment quality criteria for PCBs are shown in Table 3-5 from the <i>Guidance on Remedial Actions for Superfund Sites with PCB Contamination</i>.</p> <p>The guidance document provides a method to determine cleanup levels based on site conditions and assumptions, but does not provide a criteria. This is not a regulatory criteria or site-specific value and was therefore not retained as a PRG.</p> | <p>Based on percent organic carbon (%OC)</p> |

ATTACHMENT 1

**Evaluation of Applicable or Relevant and Appropriate Requirements
Draft Preliminary Remedial Goal Identification**

| Citation | Summary of Requirement | Criteria |
|---|--|-------------------------------|
| Groundwater | | |
| <p>DOE Oak Ridge National Laboratory (ORNL) <i>Screening Levels for Chemical Contaminants</i> including the Region 9 PRG</p> <p>(http://epa-prgs.ornl.gov/chemicals/index.shtml)</p> | <p>Generic screening levels are based on default exposure parameters and factors that represent Reasonable Maximum Exposure (RME) conditions for long-term/chronic exposures and are based on the methods outlined in EPA's Risk Assessment Guidance for Superfund, Part B Manual (1991). The screening levels provided correspond to a 10^{-6} cancer risk for high risk PCBs, such as Aroclors 1242, 1248, 1254, and 1260. Region 9 Preliminary Remediation Goals (PRG) protective of human health for the ingestion and inhalation exposure pathways is 0.034 g/L for tap water (high risk PCBs).</p> <p>Region 9 PRGs are intended for use as screening levels to determine if remedial actions may be necessary, but are not intended to be used as cleanup criteria. The screening levels are not regulatory criteria or site-specific values and were not carried forward for further evaluation as PRGs. In addition, a completed pathway is not currently believed to be present for ingestion of the shallow groundwater.</p> | <p>Tap Water 0.034 g/L</p> |
| <p>Michigan Natural Resources and Environmental Protection Act— Part 201 of Act 451</p> <p>(Part 7 R299.5701- 5707, 5718-5752)</p> | <p>Groundwater Surface Water Interface (GSI) Criteria of 0.2 g/L is presented in Part 201, Environmental Remediation of the Natural Resources and Environmental Protection Act, PA 451 of 1994, as amended, and Part 201 Administrative Rules. The calculated criterion is below the analytical target detection limit; therefore, the criterion defaults to the target detection limit.</p> <p>The Part 201 generic cleanup criteria for groundwater was retained as a PRG where the GSI is present on the site.</p> | <p>GSI 0.2 g/L</p> |
| <p>Michigan Natural Resources and Environmental Protection Act— Part 201 of Act 451</p> <p>(Part 7 R299.5701- 5707, 5718-5752)</p> | <p>Generic Residential and Industrial-Commercial Drinking Water Standard of 0.5 g/L for PCBs, is presented in Part 201, Environmental Remediation of the Natural Resources and Environmental Protection Act, PA 451 of 1994, as amended, and Part 201 Administrative Rules. Part 201 adopted the criterion which is the State of Michigan drinking water standard established pursuant to section 5 of 1976 PA 399, MCL 325.1005.</p> <p>A completed pathway is not currently believed to be present for ingestion of the shallow groundwater. A PRG for groundwater based on ingestion was not evaluated.</p> | <p>Drinking Water 0.5 g/L</p> |
| <p>Michigan Natural Resources and Environmental Protection Act— Part 201 of Act 451</p> | <p>Groundwater Contact Criteria of 3.3 g/L for PCBs, presented in Part 201, Environmental Remediation of the Natural Resources and Environmental Protection Act, PA 451 of 1994, as amended, and Part 201 Administrative Rules.</p> | <p>Direct Contact 3.3 g/L</p> |

ATTACHMENT 1

Evaluation of Applicable or Relevant and Appropriate Requirements

Draft Preliminary Remedial Goal Identification

| Citation | Summary of Requirement | Criteria |
|--|--|--|
| (Part 7 R299.5701- 5707, 5718-5752) | A shallow water table is present in the area with the expression of seeps to the ground surface. The Part 201 generic cleanup criteria to be protective of human health through contact with groundwater was retained as a PRG. | |
| Surface Water | | |
| Clean Water Act—Water Quality Standards (33 U.S.C. 1311 et. seq.; 40 CFR 131) | The Clean Water Act and the Michigan Natural Resources and Environmental Protection Act regulate concentrations of PCBs in surface waters. According to the Clean Water Act National Toxics Rule (40 CFR 131.36; as updated by USEPA on November 9, 1999 [64 FR 61181]), the water quality criterion for total PCBs in surface water is 0.00017 g/L for both the water-and-organism consumption and water-only consumption human health criteria. The 2002 update to the National Recommended Water Quality Criteria established pursuant to Section 303(a) of the Clean Water Act for total PCBs are 0.000064 g/L for both types of human health criteria and 0.014 g/L for the freshwater aquatic life criteria continuous concentration. PRGs were not developed for surface water. PCBs in surface water will be addressed as a result of remedial actions for soil and sediment. | 1999 Human Health 0.00017 g/L 2002 Update Human Health 0.000064 g/L Freshwater Aquatic Life 0.014 g/L |
| Michigan Natural Resources and Environmental Protection Act –Part 31 of Act 451 (Part 4 R323.1041-1117) | According to Part 4 (Water Quality Standards) Rule 57 (Toxic Substances) of the Administrative Rules for Part 31 (Water Resources Protection) of the Michigan Administrative Code, the acceptable levels of PCBs in surface water are 0.000026 g/L for human health (both drinking and nondrinking uses) and 0.00012 g/L for wildlife. PRGs were not developed for surface water. PCBs in surface water will be addressed as a result of remedial actions for soil and sediment. | Human Health 0.000026 g/L Wildlife 0.00012 g/L |
| Final (Revised) Baseline Ecological Risk Assessment (BERA) for the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. CDM, April 2003. | The No Observed Adverse Effect Level (NOAEL) to Lowest Observed Adverse Effect Level (LOAEL) range from 0.00098 g/L to 0.00197 g/L PCB for the protection of aquatic ecological receptors (mink) as established in the BERA. The BERA is currently under review, but the NOAEL and LOAEL are provided for comparison to other potential ARARs. PRGs were not developed for surface water. PCBs in surface water will be addressed as a result of remedial actions for soil and sediment. | NOAEL 0.00098 g/L LOAEL 0.00197 g/L |
| Fish Tissue | | |
| Food and Drug Administration | Tolerances for PCBs in food for human consumption are identified in 21 CFR 109.30 for residues of PCB as unavoidable environmental or industrial contaminants in foods | Fish filets 2 mg/kg |

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|--|--|--|
| Tolerances for PCBs in food for human consumption (21 CFR 109.30) | for human consumption "until the elimination of such contaminants at the earliest possible time." Temporary tolerance for PCBs in the edible portions of fish (excludes head, scales, viscera, and inedible bones) is 2 ppm. Provides guidance for actions involving fish consumption advisories. PRGs were not developed for fish. PCBs in fish will be addressed through remedial actions for soil and sediment. | |
| Michigan Department of Community Health (MDCH) Fish Contaminant Monitoring Program (FCMP) (referenced from HHRA) | The MDCH Fish Contaminant Monitoring Program evaluates fish samples for PCBs and other potential contaminants in determination of fish consumption advisories. The Trigger Levels for total PCBs in fish as determined by the MDCH Fish Contaminant Monitoring Program are as shown. PRGs were not developed for fish. PCBs in fish will be addressed through remedial actions for soil and sediment. The fish consumption advisories will be maintained independent of this evaluation. | General Population 2.0 mg/kg Women of Child-Bearing Age and Children Under 15 1 meal/ wk 0.05 mg/kg 1 meal/mo 0.2 mg/kg 6 meals/yr 1.0 mg/kg No consumption 1.9 mg/kg |
| Final (Revised) Human Health Risk Assessment (HHRA) of the Allied Paper, Inc./Portage Creek/Kalamazoo River (API/PC/KR) Superfund Site. CDM, April 2003. | Risk-based fish concentrations were developed to be protective of sport and subsistence anglers for both cancer and noncancer endpoints. Risk-based concentrations were developed for PCBs using an allowable cancer risk of 1 in 100,000 and a noncancer hazard index of 1.0. For the noncancer risk, only the immunological endpoint was calculated because this is more protective than the reproductive endpoint and is always a lesser concentration. The RBCs represent the concentration in the fillet. <u>RBC for 1E-05 based on Bass/Carp Ingestion</u> Subsistence angler (179 meals/yr) 0.015 mg/kg Sport angler – high end (125 meals/yr) 0.042 mg/kg Sport angler – central tendency (24 meals/yr) 0.109 mg/kg <u>RBC for HQ = 1 based on Bass/Carp Ingestion</u> Subsistence angler (179 meals/yr) 0.025 mg/kg Sport angler – high end (125 meals/yr) 0.072 mg/kg Sport angler – central tendency (24 meals/yr) 0.187 mg/kg PRGs were not developed for fish. PCBs in fish will be addressed through remedial actions for soil and sediment. | RBC for 1E-05 risk based on Bass/Carp Ingestion range from 0.015 mg/kg to 0.109 mg/kg. |